



**PATENT APPLICATION**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of

Docket No: A8700

Lawrence SHAH, et al.

Appln. No.: 10/813,269

Group Art Unit: 2828

Confirmation No.: 5356

Examiner: Dung T. NGUYEN

Filed: March 31, 2004

For: FEMTOSECOND LASER PROCESSING SYSTEM WITH PROCESS PARAMETERS  
CONTROLS AND FEEDBACK

**INFORMATION DISCLOSURE STATEMENT**  
**UNDER 37 C.F.R. §§ 1.97 and 1.98**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

In accordance with the duty of disclosure under 37 C.F.R. § 1.56, Applicants hereby notify the U.S. Patent and Trademark Office of the documents which are listed on the attached PTO/SB/08 A & B (modified) form and/or listed herein and which the Examiner may deem material to patentability of the claims of the above-identified application.

One copy of each of the listed documents is submitted herewith, except for the following: U.S. patents and/or U.S. patent publications; and co-pending non-provisional U.S. applications filed after June 30, 2003.

The present Information Disclosure Statement is being filed: (1) No later than three months from the application's filing date; (2) Before the mailing date of the first Office Action on the merits (whichever is later); or (3) Before the mailing date of the first Office Action after

**INFORMATION DISCLOSURE STATEMENT**  
**U.S. Appln. No.: 10/813,269**

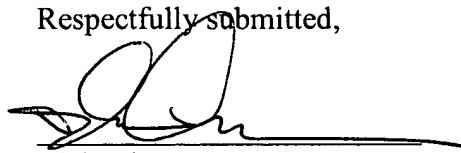
**A8700**

filing a request for continued examination (RCE) under §1.114, and therefore, no Statement under 37 C.F.R. § 1.97(e) or fee under 37 C.F.R. § 1.17(p) is required.

The submission of the listed documents is not intended as an admission that any such document constitutes prior art against the claims of the present application. Applicants do not waive any right to take any action that would be appropriate to antedate or otherwise remove any listed document as a competent reference against the claims of the present application.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account. A duplicate copy of this paper is attached.

Respectfully submitted,



Richard C. Turner  
Registration No. 29,710

SUGHRUE MION, PLLC  
Telephone: (202) 293-7060  
Facsimile: (202) 293-7860

WASHINGTON OFFICE

**23373**

CUSTOMER NUMBER

Date: September 8, 2005

Substitute for Form 1449 A &amp; B/PTO

# **INFORMATION DISCLOSURE STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet

1

of

4

Complete if Known

Application Number	10/813,269
Confirmation Number	5356
Filing Date	March 31, 2004
First Named Inventor	Lawrence SHAH
Art Unit	2828
Examiner Name	Dung T. NGUYEN
Attorney Docket Number	A8700

## **U.S. PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document
		Number	Kind Code <sup>2</sup> (if known)		
		US RE37,585	E	03/19/2002	Gerard Mourou
		US 6,333,485	B1	12/25/2001	Richard Alan Haight
		US 6,268,586	B1	07/31/2001	Brent C. Stuart
		US 5,720,894		02/24/1998	Joseph Neev
		US 6,552,301	B2	04/22/2003	Peter R. Herman
		US 6,574,250	B2	06/03/2003	Yunlong Sun
		US 6,421,573	B1	07/16/2002	James D. Kafka
		US 6,285,002	B1	09/04/2001	Bryan Kok Ann Ngoi
		US 2002/0023903		02/28//2002	Bryan Kok Ann Ngoi
		US 6,341,009	B1	01/22/2002	John O'Connor
		US 6,146,375		11/14/2000	Tibor Juhasz
		US 2002/0193704	A1	12/19/2002	Peter Goldstein
		US 6,414,320	B1	07/2/2002	Muriel Y. Ishikawa
		US 5,978,538		11/2/1999	Kiyotaka Miura
		US 2002/0076655	A1	06/20/2002	Nicholas F. Borrelli
		US 2003/0099452	A1	05/29/2003	Nicholas F. Borrelli
		US 2003/0035640	A1	02/20/2003	Mark Dugan
		US 6,573,026	B1	06/3/2003	Bruce G. Aitken
		US 2003/0110810	A1	06/19/2003	Douglas Scott Dunn
		US 6,392,683	B1	05/21/2002	Kenichi Hayashi
		US 6,407,361		06/18/2002	Mark S. Williams

## **FOREIGN PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document			Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Translation <sup>6</sup>
		Country Code <sup>3</sup>	Number <sup>4</sup>	Kind Code <sup>5</sup> (if known)			

## **NON PATENT LITERATURE DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city, and/or country where published.	Translation <sup>6</sup>
		Tae Y. Choi, "Ultra-fast laser-induce processing of materials: fundamentals and applications in micromaching." SPIE Proceedings Vol 4637 (2002) pp. 204-211	
		Ihtesham H. Chowdhury, "Ultrafast pulse train micromaching," Spie Proceedings Vol 4978 (2003) pp. 138-146	
		Santiago Camacho-Lopez, "Single-pulse and 'pulsetrain-burst' (>100MHz) effects in ultrafast laser processing of metals, glasses, and bio-tissues" OSA CLEO 2003 in Baltimore, MD (May) Paper CFF2	

Examiner Signature	Date Considered
--------------------	-----------------

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See Kind Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov), MPEP 901.04 or in the comment box of this document. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST. 3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to indicate here if English language Translation is attached.

Substitute for Form 1449 A &amp; B/PTO

# **INFORMATION DISCLOSURE STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet

2

of

4

Complete if Known

Application Number	10/813,269
Confirmation Number	5356
Filing Date	March 31, 2004
First Named Inventor	Lawrence SHAH
Art Unit	2828
Examiner Name	Dung T. NGUYEN
Attorney Docket Number	A8700

## **U.S. PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document
		Number	Kind Code <sup>2</sup> (if known)		
		US 6,312,768		11/6/2001	Andrei Rode
		US 6,372,103	B1	4/16/2002	Michael D. Perry
		US			

## **FOREIGN PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document			Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Translation <sup>6</sup>
		Country Code <sup>3</sup>	Number <sup>4</sup>	Kind Code <sup>5</sup> (if known)			

## **NON PATENT LITERATURE DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city, and/or country where published.	Translation <sup>6</sup>
		Craig W. Siders, "Burst-mode femtosecond ablation in Copper and Lexan" OSA CLEO 2003 in Baltimore, MD (May) paper CFF3	
		L. Sudrie, "Writing of permanent birefringence microlayers in bulk fused silica with femtosecond laser pulses" Optics Communications 171 (1999) 279-284	
		Roberto Osellame, "Femtosecond writing of active optical waveguides with astigmatically shaped beams" J. Opt. Soc. Am. B Vol. 20 No 7/ July 2003 p 1559-1567	
		John D. Mills, "Embedded anisotropic microreflectors by femtosecond-laser nanomachining" Applied Physics Letters Vol. 81, No. 2 July 2002, p196-198	
		A. Bado, "Manufacturing of High quality Integrated Optical Components by Laser Direct-Write (M103) ICALEO 2003 in Jacksonville, FL. Laser Microfabrication, LMF Section C p 18-26	
		L. Sudrie, "Study of damage in fused silica induced by ultra-short IR laser pulses" Optics Communications 191 (2001) 333-339	
		P. G. Kazansky, "Self-organized form birefringence in glass irradiated by intense ultrashort light pulses" OSA CLEO 2003 in Baltimore, MD (May) paper CW11	
		Henry Haefke, "Microtexturing of functional surfaces for improving their tribological performance" Proceeding of the International Tribology Conference, Nagasaki, 2000 p 217-221	
		H.K. Tonshoff, "Structuring silicon with femtosecond lasers," SPIE Proceedings Vol. 4274 (2001) p 88-97	
		J. Bonse, "Femtosecond laser ablation of silicon-modification thresholds and morphology," Applied Physics A 74, 19-25, (2002)	
		Jurgen Reif, "Ripples revisited: non-classical morphology at the bottom of femtosecond laser ablation craters in transparent dielectrics," Applied Surface Science 197-198 (2002) 891-895	

Examiner Signature

Date Considered

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See Kind Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov), MPEP 901.04 or in the comment box of this document. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST. 3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to indicate here if English language Translation is attached.

Substitute for Form 1449 A &amp; B/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet

3

of

4

Complete if Known

Application Number	10/813,269
Confirmation Number	5356
Filing Date	March 31, 2004
First Named Inventor	Lawrence SHAH
Art Unit	2828
Examiner Name	Dung T. NGUYEN
Attorney Docket Number	A8700

**U.S. PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document
		Number	Kind Code <sup>2</sup> (if known)		
		US			

**FOREIGN PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document			Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Translation <sup>6</sup>
		Country Code <sup>3</sup>	Number <sup>4</sup>	Kind Code <sup>5</sup> (if known)			

**NON PATENT LITERATURE DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city, and/or country where published.	Translation <sup>6</sup>
		Egidijus Vanagas, "Surface nanostructuring of borosilicate glass by femtosecond nJ energy pulses," Applied Physics Letters Vol.82, No. 17, 28 April 2003, p.2901-2903	
		R.S. Taylor, "Femtosecond Laser Fabricated Nanostructures in Silica Glass," OSA CLEO 2003 in Baltimore, MD (May). Paper CWA18	
		R.S. Taylor, "Ultra-High Resolution Index of Refraction Profiles of Femtosecond Laser Modified Silica Structures," OSA CLEO 2003 in Baltimore, MD (May). Paper CW13	
		David Ashkenasi, "Processing of multi-layer systems using femtosecond, picosecond, and nanosecond laser pulses at different wavelengths," SPIE Proceedings Vol. 4637 (2002) p169-179	
		Alexei K. Zaitsev, "New low temperature femto-second laser annealing method for TFT fabrication technology," OSA CLEO 2003 in Baltimore, MD (May). Paper CTHM34	
		Ian Jones, "Laser Welding of Plastics-Process Selection Software (601) ICALEO 2003 in Jacksonville, FL. Laser Materials Processing LMP Section A p 76-84	
		Ian Jones, "Laser Welding of Plastics-Process Selection Software (601) ICALEO 2003 in Jacksonville, FL. Laser Materials Processing LMP Section A p 76-84	
		Nicole M. Woosman, "A Study of the Effect of Weld Parameters on Strengths of Clearwelded Thermoplastics (602) ICALEO 2003 in Jacksonville, FL. Laser Materials Processing, LMP Section A p 85-93	
		Kulik et al, <i>Short and ultrashort laser pulses: an upcoming tool for processing optical and semiconductor materials</i> , Proc. SPIE Int. Soc. Opt. Eng. 5339, 35 (2004)	
		Said et al, <i>Manufacturing by laser direct-write of three-dimensional devices containing optical and microfluidic networks</i> , Bado, Said, Dugan, Translume, Proc. SPIE Int. Soc. Opt. Eng. 5339, 194 (2004)	
		Ostendorf et al, <i>Ablation of metals and semiconductors with ultrashort pulsed lasers: improving surface qualities of microcuts and grooves</i> , Proc. SPIE Int. Soc. Opt. Eng. 5340, 153 (2004)	
		Watanabe et al, <i>Fabrication of photonic devices with femtosecond laser pulses</i> , Proc. SPIE Int. Soc. Opt. Eng. 5340, 119 (2004)	
		Femtosecond laser machining of integrated capillaries in microfluidic devices, Tyson N. Kim Photonics West Poster Session 5340-31 Only, no paper submitted	

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

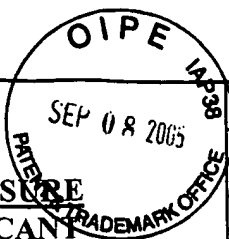
\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See Kind Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov), MPEP 901.04 or follow the hyperlink from the title of the document to the intranet. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST. 3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to indicate here if English language Translation is attached.

Substitute for Form 1449 A &amp; B/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)



Complete if Known

Application Number	10/813,269
Confirmation Number	5356
Filing Date	March 31, 2004
First Named Inventor	Lawrence SHAH
Art Unit	2828
Examiner Name	Dung T. NGUYEN
Attorney Docket Number	A8700

Sheet 4 of 4

**U.S. PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document
		Number	Kind Code <sup>2</sup> (if known)		
		US			
		US			
		US			
		US			
		US			
		US			

**FOREIGN PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document			Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Translation <sup>6</sup>
		Country Code <sup>3</sup>	Number <sup>4</sup>	Kind Code <sup>5</sup> (if known)			

**NON PATENT LITERATURE DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city, and/or country where published.	Translation <sup>6</sup>
		A. Ostendorf et al, "Ablation of metals and semiconductors with ultrashort-pulsed lasers: improving surface qualities of microcuts and grooves", Proc., SPIE vol 5340 (2004) pp. 153-163	
		W. Watanabe et al, "Fabrication of photonic devices with femtosecond laser pulses", Proc SPIE, vol 5340 (2004) pp. 119-126	
		A. Said et al, "Manufacturing by laser direct-write of three-dimensional devices containing optical and microfluidic networks", Proc SPIE vol. 5339 (2004) pp. 194-204	
		C. Kulik, "Short and Ultrashort Laser Pulses: An upcoming Tool for Processing Optical and Semiconductor Materials", Proc. SPIE vol. 5339 (2004) pp. 35-48	

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup>Applicant's unique citation designation number (optional). <sup>2</sup>See Kind Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov), MPEP 901.04 or follow the hyperlink from the title of the document to the intranet. <sup>3</sup>Enter Office that issued the document, by the two-letter code (WIPO Standard ST. 3). <sup>4</sup>For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup>Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup>Applicant is to indicate here if English language Translation is attached.